

What is claimed is:

1. A method for forming and vulcanizing an air spring flexible member blank having a predetermined length, the method utilizing an apparatus including: a mold defining a longitudinal axis and a bellied inner wall defining a common hollow space having a bellied expanse for receiving the air spring flexible member blank therein; a pressure bellows unit including a pressure bellows extending axially in said common hollow space; and, said pressure bellows unit including first and second end pieces joined to said pressure bellows at corresponding longitudinal ends thereof; the method comprising the steps of:

placing said blank over said pressure bellows with said blank having approximately the double length of a manufactured flexible member;

introducing pressurized air into the interior of said pressure bellows to expand said pressure bellows thereby pressing said blank against said bellied inner wall and causing said pressure bellows to shorten along said longitudinal axis; and,

causing said end pieces to move along said longitudinal axis to follow the shortening of said pressure bellows as said pressure bellows expands thereby holding a mechanical loading on said pressure bellows to a low value.

2. The method of claim 1, wherein said first end piece is guided by a piston rod passing through said second end piece and said piston rod is connected to a first linear drive unit; said second end piece is connected to a second linear drive unit; and, said first and second linear drive units are connected to a control unit which drives said drive units so that said end pieces move

toward each other as a function of the pressure imparted by said pressurized air so that the mechanical load between said pressure bellows and said end pieces remains small.

3. The method of claim 1, wherein it is unnecessary to apply pressure to said pressure bellows in advance; and, said mold is heated during the vulcanization time.

4. The method of claim 1, wherein said blank, after vulcanization, is removed from said mold after the latter is opened.

5. The method of claim 1, wherein said blank is separated at the middle thereby providing two flexible members of equal size.

6. The method of claim 2, wherein said pressure space within said pressure bellows is supplied via a central bore in the piston rod connected to said first end piece.

7. An apparatus for forming and vulcanizing an air spring flexible member blank having a predetermined length, the apparatus comprising:

5 a double mold assembly including an upper mold half and a lower mold half conjointly defining a partition plane whereat said mold halves can be separated from each other;

said upper mold half and said lower mold half defining a common longitudinal axis and said mold halves having corresponding inner walls defining corresponding approximately  
10 bottle-shaped hollow spaces which are mirror images of each other so that said hollow spaces conjointly form a common hollow space

having a bellied expanse for receiving the air spring flexible member blank therein;

15 a pressure bellows unit including a pressure bellows extending axially in said common hollow space within said air spring flexible member blank along a length corresponding approximately to the length of said blank and said pressure bellows enclosing a pressure space;

20 said pressure bellows unit including first and second end pieces joined to said pressure bellows at corresponding longitudinal ends thereof;

25 means for supplying pressurized air or gas to said pressure space of said pressure bellows to cause said pressure bellows to expand laterally to press said blank against the composite inner wall defining said common hollow space whereby said pressure bellows shortens in length; and,

30 said end pieces being movably mounted in said double mold assembly so as to permit said end pieces to follow said pressure bellows as said pressure bellows shortens with the supply of said pressurized air or gas.

8. The apparatus of claim 7, said pressure bellows unit comprising a piston for movably connecting said first end piece to said second end piece; said piston and said second end piece conjointly defining an interface; and a slide bearing and a seal  
5 diagnosed at said interface.

9. The apparatus of claim 8, said pressure space of said pressure bellows being a first pressure space; said pressure bellows unit further comprising pneumatic cylinder unit coupled to said second end piece and said piston rod; said pneumatic

5 cylinder unit including a cylinder and a piston disposed in said  
cylinder and said piston and said cylinder conjointly defining a  
second pressure space; said first and second pressure spaces  
being connected to each other; said piston rod and said second  
10 end piece conjointly defining an annular surface and said piston  
defining a surface delimiting said second pressure surface; and,  
said annular surface and said surface of said piston having equal  
areas.

10. The apparatus of claim 9, wherein the stroke of said piston  
rod is always twice the stroke of said piston of said pneumatic  
cylinder unit.

11. The apparatus of claim 8, further comprising a first linear  
drive operatively connected to said piston rod for imparting  
movement thereto along said axis; and, a second linear drive for  
imparting movement to said second end piece along said axis.

12. The apparatus of claim 7, further comprising means for  
electrically heating said upper and lower mold halves.

13. The apparatus of claim 7, wherein said pressure bellows has  
a length corresponding approximately to the length of said blank  
and said pressure bellows is made of elastomeric material.

14. An arrangement for forming and vulcanizing a plurality of  
air spring flexible member blanks, the arrangement comprising: a  
rotatable turret; a plurality of apparatuses for forming the  
vulcanizing corresponding ones of said blanks; said apparatuses  
5 being mounted on said turret spaced one from the other; means for

loading said blanks into corresponding ones of said apparatuses and for removing said blanks therefrom after forming and vulcanization thereof; and, each of said apparatuses including:

10 a double mold assembly including an upper mold half and a lower mold half conjointly defining a partition plane whereat said mold halves can be separated from each other;

said upper mold half and said lower mold half defining a common longitudinal axis and said mold halves having corresponding inner walls defining corresponding approximately bottle-shaped hollow spaces which are mirror images of each other  
15 so that said hollow spaces conjointly form a common hollow space having a bellied expanse for receiving the air spring flexible member blank therein;

a pressure bellows unit including a pressure bellows  
20 extending axially in said common hollow space within said air spring flexible member blank along a length corresponding approximately to the length of said blank and said pressure bellows enclosing a pressure space;

said pressure bellows unit including first and second end  
25 pieces joined to said pressure bellows at corresponding longitudinal ends thereof;

means for supplying pressurized air or gas to said pressure space of said pressure bellows to cause said pressure bellows to expand laterally to press said blank against the composite inner  
30 wall defining said common hollow space whereby said pressure bellows shortens in length; and,

said end pieces being movably mounted in said double mold assembly so as to permit said end pieces to follow said pressure bellows as said pressure bellows shortens with the supply of said  
35 pressurized air or gas.